*Devoted to bridging knowledge, practice, and service.*

Cardinal Stritch University - College of Education and Leadership

Secondary Education Master of Arts in Teaching Program

# EDM 544: Elementary/Middle School Methods for Science

**Credits:** 1 credit

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**Cohort 13 Kenosha:** Mondays/Wednesdays, 4:30 - 8:30 P.M. June 16, 21, 23, 28

**Cohort 19 Milwaukee:** Tuesdays/Thursdays, 4:30 -8:30 P. M. July 6, 8, 13, 15

**Class wiki (Cohort 13):** http://cohort13science.wikispaces.com/

**Class wiki (Cohort 19):** http://cohort19science.wikispaces.com/

## COURSE DESCRIPTION

This course is designed to explore and practice the skills necessary to fulfill the role of science teacher for elementary or middle school students, including general informationon curriculum development, component areas of science, unit development, methods specific to science, computer technology as integrated into the curriculum, and the relationship of science to other subject areas. As a result of the class you will accumulate resources that can be used for the teaching of many science topics at a variety of levels. We will utilize collaborative technology to share our resources to help build your arsenal for future teaching assignments.

**PROGRAM OUTCOMES**

The Program Outcomes for the Masters of Arts in Teaching Program (MAT) are the ten Wisconsin Teacher Standards. All course objectives are stated to reflect the knowledge, dispositions and performances of specific Wisconsin Teacher Standards. Assessments are directly aligned with one or more specific teacher standards that require teacher candidates to demonstrate specific knowledge, and/or dispositions, and/or performances.

**Wisconsin Teacher Standards and Assessments Connected to EDM 544**

Standard 1: Teachers know the subject they are teaching.

The teacher understands the central concepts, tools of inquiry, and structures of the discipline she or he teaches and can create learning experiences that make these aspects of subject matter meaningful for pupils.

**Standard 4: Teachers know how to teach**

The teacher understands and uses a variety of instructional strategies, including the use of technology, to encourage children’s development of critical thinking, problem solving, and performance skills.

**Standard 7: Teachers are able to plan different kinds of lessons.**

The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.

**Standard 9: Teachers are able to evaluate themselves.**

The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out; opportunities to grow professionally.

**Standard 10: Teachers are connected with other teachers and the community.**   
The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support pupil learning and well-being and acts with integrity, fairness and in an ethical manner.

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| **Assessment: Science Journal and Reflection based on Text**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard # 9 by completing reflections on the assigned text and prompts related to their future teaching situation. |
| **WTS 9: Teachers are able to evaluate themselves.**  The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out; opportunities to grow professionally. |

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| **Assessment:** **Annotated Bibliography of Science Resources**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard #s 1 and 10 by completing online exploration to create an annotated bibliography of available science resources and sharing them with other educators. |
| **WTS 1. Teachers know the subject they are teaching.**  The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.  **WTS 10: Teachers are connected with other teachers and the community.**  The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support pupil learning and well-being and acts with integrity, fairness and in an ethical manner. |

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| **Assessment:** **Lesson Analysis**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard #s 4 and 7 by analyzing and improving a science lesson. |
| **WTS 4: Teachers know how to teach**  The teacher understands and uses a variety of instructional strategies, including the use of technology, to encourage children’s development of critical thinking, problem solving, and performance skills.  **WTS 7: Teachers are able to plan different kinds of lessons.**  The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals. |

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| **Assessment: Learning Lab Demonstration**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard #s 1, and 4 by demonstrating a science activity for their peers. |
| **WTS 1. Teachers know the subject they are teaching.**  The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.  **WTS 4: Teachers know how to teach**  The teacher understands and uses a variety of instructional strategies, including the use of technology, to encourage children’s development of critical thinking, problem solving, and performance skills. |

**REQUIRED TEXT:**

Zemelman, S., Daniels, H., & Hyde, A. (2005). *Best practice: Today’s standards for teaching and learning in America’s schools* (3rd Ed.). Portsmouth, NH: Heinemann.

Wisconsin’s Model Academic Standards for Science will be the basis for the course. Standards may be accessed on the Wisconsin DPI website

**COURSE EXPECTATIONS**

* Syllabus is subject to change based on the needs of the class as determined by instructor and students.
* Attendance is required. Based on department policy, missing one class in this course can result in anautomatic drop. One absence may be considered excused if the student informs the instructor that he/she will be absent **before** class **and** contacts the instructor regarding material covered in class. Students are responsible for securing lecture notes and handouts.
* Assignment completion is assumed. To receive a passing grade on assignments, candidates must have submitted assignments by the due date listed on the course schedule, demonstrate insightful reflection and accurate interpretation, and follow assignment guidelines. **Late assignments may be marked down one full step on the scoring rubric,** although students may be granted an occasional extension. If a writtenextension is granted based on individual circumstances, requirements must be met according to theagreements made between the instructor and the student.
* Teaching is both an art and a science. Therefore, the process is equally as important as the product. Attitude, integrity, and participation will be reflected on the department Attitude and Disposition survey completed by the instructor.

**POLICY NOTES**

1. Cardinal Stritch University and the instructor wish to positively affirm the intent of the Americans with Disabilities Act. Any person enrolling in this course who may require alternative instructional and/or evaluative procedures due to a disability should feel free to discuss these needs with the instructor so that the appropriate arrangements can be made.
2. Academic Integrity: Students are referred to the Student Handbook for the policy an academic integrity and specifically the policy on material that is plagiarized from the Internet or other students.

#### COURSE ASSIGNMENTS

* **Science Journal and Reflection based on Text**: **25% of Grade**

(Due class 2-4) Teacher candidates will post a reflective journal prompt to the course wiki (under discussion) each class based on the following prompts:

Due class 2:

1. After reading chapter 5 of *Best Practice*, describe your understanding of what “inquiry” means in science.
2. How does this compare with your experiences of Science classes as a student?

Due class 3:

1. What practical benefits and potential issues do you see in using inquiry to teach Science?
2. Describe an activity or method that you’ve learned about that you could see yourself using in your classroom.

Due class 4:

1. Compare and contrast best practice in science to other curricular areas you’ve studied.
2. What have you learned that you hope to use in your classroom?
3. What new questions or issues have arisen for you?
4. What resources can you use to address these questions or issues?

* **Annotated Bibliography of Resources**: **25% of Grade**

(Due Class 2) Teacher candidates will locate eight resources, with each resource pertaining to a different Science Content Standard. Candidates are encouraged to look for technological (e.g. video, online picture) and community resources (not-for-profit organization or business). Each resource will include a title, link to the resource, a short description of the resource, and grade level(s). These resources will be submitted at class 2 AND shared on the course wiki.

* **Lesson Analysis: 25% of Grade**

(Due Class 3) Teacher candidates will locate an existing lesson (from the internet or a practicing teacher for example). Candidates will write an analysis of how the lesson ties to the content standards, how it integrates constructivist techniques, how it could better utilize constructivist techniques (if applicable), and how they would manage the materials and students during the lesson.

Product: written analysis (25%)

* **Learning Lab:**  **25% of Grade**

(Due class 4) Teacher candidates will teach a science lesson using appropriate strategies and methodologies. Teacher candidates will lead a small group through a science investigation not yet demonstrated during class. Candidates will share an outline of the activity in RIO format on the course wiki and turn in a hard copy to the instructor.

The above assignments will be evaluated using a 4-point rubric. The final course grade will be determined by combining final scores from each of the graded assignments with the weight of each grade as designated above. Letter grades will be assigned using the following scale:

**Grading Scale**

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| --- | --- | --- | --- | --- |
| Passing Grades | | **A course grade of C+ or lower results in repeating the course.** | | |
| **Exemplary** | **Proficient** | **Basic/Novice** | **Minimal/Not Proficient** | **Fail** |
| A 3.75 - 4.0  A- 3.5 – 3.74 | B+ 3.33– 3.49  B 3.0 – 3.32  B- 2.75– 2.9 | C+ 2.5 – 2.74  C 2.0 – 2.49  C- 1.5 – 1.99 | D+ 1.25 – 1.49  D .75 – 1.24 | < .74 |

(MAT Policy: A course grade of a C+ or lower results in repeating the course.)

**APA Manuscript Format**

All written work should adhere to latest edition of APA Manuscript Format unless otherwise directed.

**COURSE SCHEDULE:**

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| **Class** | **Topics** | **Assessments Due** |
| 1 | * Introductions to course, instructor * What is science? * How will I teach science? Process vs. Content * Paper Towers: PHEOC * What is inquiry? (article) * Investigation: EEEP “The Sound Pipe” (physical science) * Connect activities to inquiry and WI science standards |  |
| 2 | * Milk experiment: PHEOC * Methods of teaching science: article jigsaw * Science investigation: Cookie Mining (earth and environmental science) * Connect to inquiry and standards * “Oh Deer!” activity (outside) (life/environmental science) | Annotated Bibliography due- hard copy and shared digitally  Read chapter 5 of *Best Practice* and post response to the first set of prompts on the wiki. |
| 3 | * Technology in science: “Science Court: Inertia” * Share resources and discuss applications * Bill Nye * Portfolios * Discuss lessons | Lesson Analysis due  Second set of reflective prompts due. |
| 4 | * Learning lab presentations * Analyze lessons for inquiry and student understanding * Q & A   Course Evaluations | Learning lab presentation  Final set of reflective prompts due |

### Assessment Packet

**Assessment I: Science Journal and Reflection based on Text**

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| --- | --- | --- |
| **Assessment: Science Journal and Reflection based on Text**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard # 9 by completing reflections on the assigned text and prompts related to their future teaching situation. | | |
| **WTS 9: Teachers are able to evaluate themselves.**  The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out; opportunities to grow professionally. | | |
| **Knowledge**   * The teacher understands methods of inquiry that provide him/her with a variety of self assessment and problem-solving strategies for reflecting on his/her practice, its influences on students growth and learning, and the complex interactions between them. * The teacher understands critical frameworks for reflecting on teaching practice (e. g. frameworks from social, cultural, and philosophical foundations of education). * The teacher is aware of major areas of research on teaching and of resources available for professional learning (e. g. professional literature, colleagues, professional associations, professional development activities). | **Dispositions**   * The teacher values critical thinking and self-directed learning as habits of mind. * The teacher is committed to reflection, assessment, and learning as an ongoing process. * The teacher is willing to give and receive help. * The teacher is committed to seeking out, developing, and continually refining practices that address the individual needs of students. * The teacher recognizes his/her professional responsibility for engaging in and supporting appropriate professional practices for self and colleagues. | **Performances**   * The teacher articulates and defends a philosophy of education to guide his/her practice and contributes to the stated philosophy of the school building/district. * The teacher uses classroom observation, information about students, cultural, social, and philosophical frame-works, and research as sources for evaluating the outcomes of teaching and learning and as a basis for reflecting on and revising practice. * The teacher seeks out professional literature, colleagues, and other resources to support his/her own development as a learner and a teacher. * The teacher draws upon professional colleagues within the school and other professional areas as supports for reflection, problem-solving and new ideas, actively sharing experiences and seeking and giving feedback. |

**Science Journal and Reflection based on Text**

**Description**

(Due classes 2-4) Teacher candidates will post a reflective journal prompt to the course wiki each class based on the following prompts:

Due class 2:

1. After reading chapter 5 of *Best Practice*, describe your understanding of what “inquiry” means in science.
2. How does this compare with your experiences of Science classes as a student?

Due class 3:

1. What practical benefits and potential issues do you see in using inquiry to teach Science?
2. Describe an activity or method that you’ve learned about that you could see yourself using in your classroom.

Due class 4:

1. Compare and contrast best practice in science to other curricular areas you’ve studied.
2. What have you learned that you hope to use in your classroom?
3. What new questions or issues have arisen for you?
4. What resources can you use to address these questions or issues?

Product: Posted reflections (25% of grade)

**EDM 520 Elementary /Middle Science Methods**

Science Journal and Reflection based on Text

Teacher Candidate: Date:

Instructor:

*WTS 9: Teachers are able to evaluate themselves.*

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| **Required criteria** | **4 - A** Exemplary/  Advanced | **3 - B**  Proficient | **2 - C**  Novice/  Developing | **1/O - D/F**  Minimal/  Incomplete | **Total** |
| Reflections include application of knowledge gained in class to future science teaching |  |  |  |  |  |
| Emerging philosophy and beliefs of science education is evident |  |  |  |  |  |
| Application to personal experience and future classroom evident |  |  |  |  |  |
|  | | | | Total |  |
| Comments: | | | | **Average:\_\_\_\_\_\_\_**  (Total pts/3)  **Grade:\_\_\_\_\_\_\_\_\_** | |

**Grading Scale**

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| --- | --- | --- | --- | --- |
| Passing Grades | | **A course grade of C+ or lower results in repeating the course.** | | |
| **Exemplary** | **Proficient** | **Basic/Novice** | **Minimal/Not Proficient** | **Fail** |
| A 3.75 - 4.0  A- 3.5 – 3.74 | B+ 3.33– 3.49  B 3.0 – 3.32  B- 2.75– 2.9 | C+ 2.5 – 2.74  C 2.0 – 2.49  C- 1.5 – 1.99 | D+ 1.25 – 1.49  D .75 – 1.24 | < .74 |

### Assessment II: Annotated Bibliography of Resources

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| **Annotated Bibliography of Science Resources**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard #s 1 and 10 by completing online exploration to create an annotated bibliography of available science resources. | | | |
| WTS 1: Teachers know the subject they are teaching.  The teacher understands the central concepts, tools of inquiry, and structures of the discipline she or he teaches and can create learning experiences that make these aspects of subject matter meaningful for pupils. | | | |
| **Knowledge**   * The teacher understands major concepts, assumptions, debates, processes of inquiry, and ways of knowing that are central to the discipline(s) s/he teaches. * The teacher understands how students 'conceptual frameworks and their misconceptions for an area of knowledge can influence their learning. * The teacher relates his/her disciplinary knowledge to other subject areas. | **Dispositions**   * The teacher realizes that subject matter knowledge is not a fixed body of facts but is complex and ever-evolving. S/he seeks to keep abreast of new ideas and understandings in the field. * The teacher appreciates multiple perspectives and conveys to learners how knowledge is developed from the vantage point of the learner. * The teacher has enthusiasm for the discipline(s) s/he teaches and sees connections to everyday life. * The teacher is committed to continuous learning and engages in professional discourse about subject matter knowledge and children's learning of the discipline. | | **Performances**   * The teacher effectively uses multiple representations and explanations of disciplinary concepts that capture key ideas and links them to students' prior understandings. * The teacher can represent and use differing viewpoints, theories, "ways of knowing," and methods of inquiry in his/her teaching of subject matter concepts. * The teacher can evaluate teaching resources and curriculum materials for their comprehensiveness, accuracy, and usefulness in representing particular ideas and concepts. * The teacher engages students in generating knowledge and testing hypotheses according to the methods of inquiry and standards of evidence used in the discipline. * The teacher develops and uses curricula that encourage students to see, question, and interpret ideas from diverse perspectives. * The teacher can create interdisciplinary learning experiences that encourage students to integrate knowledge, skills, and methods of inquiry from several subject areas. |
| **WTS 10. Teachers are connected with other teachers and the community.**  The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students’ learning and well-being. | | | |
| **Knowledge**   * The teacher understands schools as organizations within the larger community context and understands the operations of the relevant aspects of the system(s) within which s/he works. * The teacher understands how factors in the students' environment outside of school (e. g. family circumstances, community environments, health, and economic conditions) may influence students 'lives and learning. * The teacher understands and implements laws related to students' rights and teacher responsibilities (e. g. for equal education, appropriate education for students with handicapping conditions, confidentiality, privacy, appropriate treatment of students, reporting in situations related to possible child abuse) | | **Dispositions**   * The teacher values and appreciates the importance of all aspects of a child's experience. * The teacher is concerned about all aspects of a child’s well-being (cognitive, emotional, social, and physical), and is alert to signs of difficulties. * The teacher is willing to consult with other adults regarding the education and well-being of his/her students. * The teacher respects the privacy of students and confidentiality of information. * The teacher is willing to work with other professionals to improve the overall learning environment for students. | **Performances**   * The teacher participates in collegial activities designed to make the entire school a productive learning environment. * The teacher makes links with the learners’ other environments on behalf of students, by consulting with parents, counselors, teachers of other classes and activities within the schools, and professionals in other community agencies. * The teacher can identify and use community resources to foster student learning. * The teacher establishes respectful and productive relationships with parents and guardians from diverse home and community situations, and seeks to develop cooperative partnerships in support of student learning and well-being. * The teacher talks with and listens to the student, is sensitive and responsive to clues of distress, investigates situations, and seeks outside help as needed and appropriate to remedy problems. * The teacher acts as an advocate for students. |

**Annotated Bibliography**

**Description**

1. For each of the eight Science content area standards (A-H) locate one resource that would be appropriate for teaching that standard to elementary/ middle school students. Recommended: don’t forget to look for interesting visuals or videos that you could use to teach these areas, also- keep an eye out for free resources available from community organizations.
2. Write an annotated bibliography of that resource that includes:
   1. Standard area (A-H)
   2. Title
   3. Link to resource
   4. Description of resource (2-4 sentences)
   5. Range of appropriate grade levels
3. Bring a hard copy to class 2.
4. Use your new delicious.com account to bookmark the links that you find and tag them with their standard area, (a) descriptive tag(s), and the grade levels it is appropriate for.

Product: Bibliography (25%)

**EDM 520 - Rubric for Annotated Bibliography of Science Resources**

Name: Date:

Instructor:

*WTS 1: Teachers know the subject they are teaching.*

***WTS 10: Teachers are connected to other teachers and the community.***

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| **Criteria** | **4 - A Exemplary/**  **Advanced** | **3 - B**  **Proficient** | **2 - C**  **Novice/**  **Developing** | **1/O - D/F**  **Minimal/**  **Incomplete** | **Total** |
| Resources:  Bibliography contains 8 resources that are that could be used in a Science classroom |  |  |  |  |  |
| Description:  Brief descriptions of resources are informative and useful including all required information |  |  |  |  |  |
| Connection to Standards:  Resources clearly link to the standard area and could be easily applied. |  |  |  |  |  |
|  | | | | Total |  |
| **Comments:** | | | | **Average: \_\_\_\_\_\_\_\_**  (Total pts/3)  **Grade:\_\_\_\_\_\_\_\_\_\_** | |

**Grading Scale**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Passing Grades | | **A course grade of C+ or lower results in repeating the course.** | | |
| **Exemplary** | **Proficient** | **Basic/Novice** | **Minimal/Not Proficient** | **Fail** |
| A 3.75 - 4.0  A- 3.5 – 3.74 | B+ 3.33– 3.49  B 3.0 – 3.32  B- 2.75– 2.9 | C+ 2.5 – 2.74  C 2.0 – 2.49  C- 1.5 – 1.99 | D+ 1.25 – 1.49  D .75 – 1.24 | < .74 |

**Assessment III: Lesson Analysis**

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| **Lesson Analysis**  **Objective:** Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard #s 4 and 7 by analyzing and improving a science lesson. | | |
| **WTS 4. Teachers know how to teach.**  The teacher understands and uses a variety of instructional strategies, including the use of technology, to encourage children's development of critical thinking, problem solving, and performance skills. | | |
| **Knowledge**   * The teacher understands the cognitive processes associated with various kinds of learning (e. g. critical and creative thinking, problem structuring and problem solving, invention, memorization and recall) and how these processes can be stimulated. * The teacher understands principles and techniques, along with advantages and limitations, associated with various instructional strategies (e. g. cooperative learning, direct instruction, discovery learning, whole group discussion, independent study, interdisciplinary instruction). * The teacher knows how to enhance learning through the use of a wide variety of materials as well as human and technological resources (e. g. computers, audio-visual technologies, videotapes and discs, local experts, primary documents and artifacts, texts, reference books, literature, and other print resources). | **Dispositions**   * The teacher values the development of students’ critical thinking, independent problem solving, and performance capabilities. * The teacher values flexibility and reciprocity in the teaching process as necessary for adapting instruction to student responses, ideas, and needs. | **Performances**   * The teacher carefully evaluates how to achieve learning goals, choosing alternative teaching strategies and materials to achieve different instructional purposes and to meet student needs (e.g. developmental stages, prior knowledge, learning styles, learning differences, and interests). * The teacher uses multiple teaching and learning strategies to engage students in active learning opportunities that promote the development of critical thinking, problem solving, and performance capabilities and that help students assume responsibility for identifying and using learning resources. * The teacher constantly monitors and adjusts strategies in response to learner feedback. * The teacher varies his or her role in the instructional process (e. g. instructor, facilitator, coach, audience) in relation to the content and purposes of instruction and the needs of students. * The teacher develops a variety of clear, accurate presentations and representations of concepts, using alternative explanations to assist students’ understanding and presenting diverse perspectives |
| **WTS 7. Teachers are able to plan different kinds of lessons.**  The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals. | | |
| **Knowledge**   * The teacher understands learning theory, subject matter, curriculum development, and student development and knows how to use this knowledge in planning instruction to meet curriculum goals. * The teacher knows how to take contextual considerations (instructional materials, individual student interests, needs, and aptitudes, and community resources) into account in planning instruction that creates an effective bridge between curriculum goals and students' experiences. * The teacher knows when and how to adjust plans based on student responses and other contingencies. | **Dispositions**   * The teacher values both long-term and short-term planning. * The teacher believes that plans must always be open to adjustment and revision based on student needs and changing circumstances. * The teacher values planning as a collegial activity. | **Performances**   * + As an individual and a member of a team, the teacher selects and creates learning experiences that are appropriate for curriculum goals, relevant to learners, and based upon principles of effective instruction (e. g. that activate students' prior knowledge, anticipate preconceptions, encourage exploration and problem-solving, and build new skills on those previously acquired).   + The teacher plans for learning opportunities that recognize and address variation in learning styles, learning differences, and performance modes.   + The teacher creates lessons and activities that operate at multiple levels to meet the developmental and individual needs of diverse learners and help each progress.   + The teacher creates short-range and long-term plans that are linked to student needs and performance, and adapts the plans to ensure and capitalize on student progress and motivation.   + The teacher responds to unanticipated sources of input, evaluates plans in relation to short-and long-range goals, and systematically adjusts plans to meet student needs and enhance learning. |

**Lesson Analysis**

**Description:**

1. Locate an existing lesson (i.e. from the internet or a practicing teacher). Lesson must include: a) intended audience (grade/level), b) intended topic, c) materials needed.
2. Write an analysis of the lesson including:
   1. Justification of which strands of the science standards are addressed by the lesson
   2. How it integrates constructivist techniques
   3. How it could better utilize constructivist techniques (if applicable)
   4. How you would manage the materials during the lesson: (Where would you get them from (affordably)? How would you hand them out? What would you do to maintain them? How would you recollect them at the end of the lesson?)
   5. How you would manage students during the lesson (With whom would they work? Would roles be assigned, if so what would they be? How would groups be created- student selected, teacher designed, heterogeneous, homogenous?)
3. Attach the lesson to the analysis.

Product: written analysis (30%)

**EDM 520 Elementary /Middle Science Methods**

Lesson Analysis

Teacher Candidate: Date:

Instructor:

***WTS 4. Teachers know how to teach.***

***WTS 7. Teachers are able to plan different kinds of lessons.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Required criteria** | **4 - A** Exemplary/  Advanced | **3 - B**  Proficient | **2 - C**  Novice/  Developing | **1/O - D/F**  Minimal/  Incomplete | **Total** |
| Standards: selects appropriate standard(s) and justifies choice. |  |  |  |  |  |
| Constructivism: accurately describes constructivist techniques and final lesson demonstrates student-centered thinking. |  |  |  |  |  |
| Management of materials: thoughtfully describes materials plan for lesson. |  |  |  |  |  |
| Management of students: thoughtfully describes appropriate management plan. |  |  |  |  |  |
|  | | | | Total |  |
| Comments: | | | | **Average:\_\_\_\_\_\_\_**  (Total pts/4)  **Grade:\_\_\_\_\_\_\_\_\_** | |

**Grading Scale**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Passing Grades | | **A course grade of C+ or lower results in repeating the course.** | | |
| **Exemplary** | **Proficient** | **Basic/Novice** | **Minimal/Not Proficient** | **Fail** |
| A 3.75 - 4.0  A- 3.5 – 3.74 | B+ 3.33– 3.49  B 3.0 – 3.32  B- 2.75– 2.9 | C+ 2.5 – 2.74  C 2.0 – 2.49  C- 1.5 – 1.99 | D+ 1.25 – 1.49  D .75 – 1.24 | < .74 |

**Assessment IV: Learning Laboratory Presentation**

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| --- | --- | --- | --- | --- |
| **Assessment: Learning Lab Demonstration**  Objective: Teacher candidates will demonstrate specific knowledge, disposition, and performances connected to Wisconsin Teacher Standard #s 1, and 4 by demonstrating a science activity for their peers. | | | | |
| WTS 1: Teachers know the subject they are teaching.  The teacher understands the central concepts, tools of inquiry, and structures of the discipline she or he teaches and can create learning experiences that make these aspects of subject matter meaningful for pupils. | | | | |
| **Knowledge**   * The teacher understands major concepts, assumptions, debates, processes of inquiry, and ways of knowing that are central to the discipline(s) s/he teaches. * The teacher understands how students 'conceptual frameworks and their misconceptions for an area of knowledge can influence their learning. * The teacher relates his/her disciplinary knowledge to other subject areas. | **Dispositions**   * The teacher realizes that subject matter knowledge is not a fixed body of facts but is complex and ever-evolving. S/he seeks to keep abreast of new ideas and understandings in the field. * The teacher appreciates multiple perspectives and conveys to learners how knowledge is developed from the vantage point of the learner. * The teacher has enthusiasm for the discipline(s) s/he teaches and sees connections to everyday life. * The teacher is committed to continuous learning and engages in professional discourse about subject matter knowledge and children's learning of the discipline. | | **Performances**   * The teacher effectively uses multiple representations and explanations of disciplinary concepts that capture key ideas and links them to students' prior understandings. * The teacher can represent and use differing viewpoints, theories, "ways of knowing," and methods of inquiry in his/her teaching of subject matter concepts. * The teacher can evaluate teaching resources and curriculum materials for their comprehensiveness, accuracy, and usefulness in representing particular ideas and concepts. * The teacher engages students in generating knowledge and testing hypotheses according to the methods of inquiry and standards of evidence used in the discipline. * The teacher develops and uses curricula that encourage students to see, question, and interpret ideas from diverse perspectives. * The teacher can create interdisciplinary learning experiences that encourage students to integrate knowledge, skills, and methods of inquiry from several subject areas. | |
| **WTS 4. Teachers know how to teach.**  The teacher understands and uses a variety of instructional strategies, including the use of technology, to encourage children's development of critical thinking, problem solving, and performance skills. | | | | |
| **Knowledge**   * The teacher understands the cognitive processes associated with various kinds of learning (e. g. critical and creative thinking, problem structuring and problem solving, invention, memorization and recall) and how these processes can be stimulated. * The teacher understands principles and techniques, along with advantages and limitations, associated with various instructional strategies (e. g. cooperative learning, direct instruction, discovery learning, whole group discussion, independent study, interdisciplinary instruction). * The teacher knows how to enhance learning through the use of a wide variety of materials as well as human and technological resources (e. g. computers, audio-visual technologies, videotapes and discs, local experts, primary documents and artifacts, texts, reference books, literature, and other print resources). | | **Dispositions**   * The teacher values the development of students’ critical thinking, independent problem solving, and performance capabilities. * The teacher values flexibility and reciprocity in the teaching process as necessary for adapting instruction to student responses, ideas, and needs. | | **Performances**   * The teacher carefully evaluates how to achieve learning goals, choosing alternative teaching strategies and materials to achieve different instructional purposes and to meet student needs (e.g. developmental stages, prior knowledge, learning styles, learning differences, and interests). * The teacher uses multiple teaching and learning strategies to engage students in active learning opportunities that promote the development of critical thinking, problem solving, and performance capabilities and that help students assume responsibility for identifying and using learning resources. * The teacher constantly monitors and adjusts strategies in response to learner feedback. * The teacher varies his or her role in the instructional process (e. g. instructor, facilitator, coach, audience) in relation to the content and purposes of instruction and the needs of students. * The teacher develops a variety of clear, accurate presentations and representations of concepts, using alternative explanations to assist students’ understanding and presenting diverse perspectives |

**Learning Lab Presentation**

**Description:** Teacher candidates will teach a science lesson using appropriate strategies and methods. Teacher candidates will lead a small group through a science investigation not yet demonstrated during class. Candidates will share an outline of the activity in RIO format on the course wiki.

Product: Learning Lab presentation (25%)

**EDM 520 Elementary /Middle Science Methods** Learning Lab Presentation

Teacher Candidate: Date:

Instructor:

*WTS 1: Teachers know the subject they are teaching. WTS 4: Teachers know how to teach.*

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| --- | --- | --- | --- | --- | --- | --- |
| **Required criteria** | **4 - A** Exemplary/  Advanced | **3 - B**  Proficient | **2 - C**  Novice/  Developing | | **1/O - D/F**  Minimal/  Incomplete | **Total** |
| RIO lesson plan outline | * Impressively thorough RIO outline * Appropriate standards fully stated. | * Correct and complete RIO outline * Appropriate standards referenced. | * Most components of RIO outline * Some standards referenced. | | * Incorrect or incomplete RIO outline * No standards, or inappropriate standards. |  |
| Presentation of lesson to class | * Obvious preparation for presentation * Notable professionalism * Strong engagement of students | * Evidence of preparation for presentation * Reasonable professionalism * Reasonable engagement of students | * Some preparation for presentation * Developing professionalism * Some engagement of students | | * Little or no preparation for presentation * Need growth in professionalism * Little or no engagement of students |  |
| Materials | * All necessary materials prepared for investigation * All teacher-made material is professional, clear and concise * High quality hand-outs/lab guides are provided. | * Most materials prepared for investigation * Teacher-made material is generally professional, clear and concise * Hand-outs/lab guides are provided | * Some materials prepared for investigation * Some teacher-made material is professional, clear and concise * Students have a way to record their thinking. | | * Materials ill prepared for investigation * Teacher made material is lacking. * No effective method for student record of thinking is evident. |  |
| Assessment | * Quality formative/ summative assessments are evident * Appropriately matched state standard(s) to all learning objectives | * Formative/ summative assessments are complete where applicable * Appropriately matched state standard(s) to some objectives. | * Some evidence of quality assessment * Appropriately referenced state standard(s). | | * Little to no evidence of quality assessment * State standard(s) not clearly linked to lesson |  |
| Comments: | | | | **Total: \_\_\_\_\_\_\_\_\_**  **Average:\_\_\_\_\_\_\_** (Total pts/4)  **Grade:\_\_\_\_\_\_\_\_\_** | | |

**EDM 520 Elementary /Middle School Science Methods**

**Final Grade Report**

Teacher Candidate:

Instructor:

Date:

|  |  |  |
| --- | --- | --- |
|  | **Score** | **% of final Grade** |
| **Science Journal and Reflection based on Text** |  | (25%) |
| **Annotated Bibliography of Science Resources** |  | (25%) |
| **Lesson Analysis** |  | (25%) |
| **Learning Lab Presentation** |  | (25%) |
| Comments: | |  |
| **Final Grade\_\_\_\_\_\_\_\_\_** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Passing Grades | | **A course grade of C+ or lower results in repeating the course.** | | |
| **Exemplary** | **Proficient** | **Basic/Novice** | **Minimal/Not Proficient** | **Fail** |
| A3.75 - 4.0  A-3.5–3.74 | B+3.33– 3.49  B3.0 – 3.32  B-2.75– 2.9 | C+2.5 – 2.74  C2.0 – 2.49  C-1.5 – 1.99 | D+1.25 – 1.49  D.75 – 1.24 | < .74 |

(MAT Policy: A course grade of a C+ or lower results in repeating the course. )